

FIRST FIVE-YEAR REVIEW REPORT

**FOR
MGM BRAKES
SUPERFUND SITE
CLOVERDALE, CALIFORNIA**

September 2003

**Prepared for
Contract No. 68-W-98-225/WA No. 171-FRFE-0946
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105**

Approved by:

Date:

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List of Acronyms

CDFG	California Department of Fish and Game
CDM	Camp Dresser and McKee, Inc.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
DOHS	Department of Health Services
EPA	Environmental Protection Agency
EKI	Erler & Kalinowski, Inc.
ESD	Explanation of Significant Differences
FS	Feasibility Study
GCA	GCA Technology, Inc.
HLA	Harding Lawson and Associates
IHII	Indian Head Industries, Inc.
KJ	Kennedy Jenks Engineers
K/J/C	Kennedy Jenks Chilton
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCRWQCB	Northern Coast Regional Water Quality Control Board
PCB	polychlorinated biphenyls
ppb	parts per billion
ppm	parts per million
PRP	Potentially Responsible Party
RA	Remedial Action
RD	Remedial Design
ROD	Record of Decision
Site	MGM Brakes Superfund Site
SLERA	screening-level ecological risk assessment
SVOC	semivolatile organic compound
TBG	TBG Inc.
TCE	trichloroethylene
VOC	volatile organic compound

Five-year Review Summary Form

SITE IDENTIFICATION

Site name : MGM Brakes Superfund Site

EPA ID: 0946

CERCLIS ID #: CAD000074120

Region: IX **State:** CA **City/County:** Cloverdale/Sonoma

SITE STATUS

NPL status: ☒ Final ☐ Deleted ☐ Other (specify) _____

September 21, 1984

Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete

Multiple OUs? ☐ YES ☒ NO **Construction completion date:** March 25, 1998

EPA certifies completion for demolition and excavation work.

Has Site been put into reuse? ☐ YES ☒ NO

REVIEW STATUS

Reviewing agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Janet Rosati

Author title: Remedial Project Manager **Author affiliation:** EPA Region IX

Review period: May - September 2003

Date(s) of Site inspection: June 13, 2003

Type of review: ☒ Statutory

☐ Policy

(☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only

☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead

☐ Regional Discretion)

Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA Operation of Groundwater ☐ Previous Five-year Review Report

Remedial Systems

☐ Construction Completion

☒ Other (specify) Explanation of Significant Differences

Triggering action date: August 1995

Due date (five years after triggering action date): 2000

Issues / Recommendations and Follow-up Actions:

Continue to monitor groundwater for volatile organic compounds (VOCs) on a semi-annual basis as per the Final VOC Groundwater Monitoring Plan prepared by Erler & Kalinowski, Inc. on April 17, 1995. The next semi-annual groundwater monitoring event is scheduled for October 2003.

As noted during the June 2003 site inspection, the southern fence line is in disrepair and no sign is posted indicating that the property is a Superfund site. The fence will be repaired and a sign posted on the entry gate to the Site.

Protectiveness Statement:

The soil remedy at MGM Brakes Superfund Site is protective of human health and the environment since the exposure pathway for inhalation and ingestion has been removed due to a combination of excavation, offsite disposal and placement of clean fill material. Some PCB contaminated soil was left in place that contained less than 100 parts per million (ppm) of PCBs and was at least 15 feet below ground surface. A voluntary Covenant and Agreement was recorded with Sonoma County that restricts excavation of these portions of the property. The groundwater remedy, natural attenuation of VOCs, is expected to be protective upon completion by achieving levels at or below MCLs, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The 1995 ESD estimated that groundwater cleanup levels would be reached in seven years. Concentration of TCE in groundwater continue to decline and it is expected that cleanup goals will be reached within the next five years.

Executive Summary

The United States Environmental Protection Agency (EPA) completed this first five-year review of the remedial action at the MGM Brakes Superfund Site (the Site), located on the west side of Highway 101 at the south end of Cloverdale, California. This five-year review was required by statute because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow unlimited use and unrestricted exposure. The five-year review was triggered by the August 1995 Explanation of Significant Differences (ESD). The five-year review process evaluates whether the remedial measures implemented at the Site are protective of human health and the environment.

The Site is located at the southwest corner of the intersection of Donovan Road and South Cloverdale Boulevard (formerly Highway 101) in Cloverdale, California. The MGM Brakes facility manufactured and cast aluminum brake components for large motor vehicles from 1965 to 1982. Wastewater containing polychlorinated biphenyls (PCBs) was discharged into a field south of the plant from 1965 until 1972. From 1972 until 1981, the company also discharged wastewater containing ethylene glycol on site. The ethylene glycol allowed PCBs already in the ground to travel rapidly over wide areas.

In 1981, the North Coast California Regional Water Quality Control Board (NCRWQCB) and the California Department of Fish and Game (CDFG) conducted an inspection and discovered oily soil containing PCBs resulting from the wastewater discharge. From 1983 to 1988, the owners of the Site, TBG, Inc. and Indian Head Industries, Inc. conducted the Remedial Investigation/Feasibility Study (RI/FS) under EPA and State oversight. Site investigations showed that the groundwater was contaminated with volatile organic compounds (VOCs). Chemicals of concern in groundwater included benzene, chlorobenzene, cis-1,2-dichloroethylene (cis-1,2-DCE), 1,4-dichlorobenzene (1,4-DCB), 1,1-dichloroethylene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethylene (TCE), and vinyl chloride.

The September 1988 ROD selected excavation and off-site disposal of PCB contaminated soils above 10 parts per million (ppm), demolition of the casting plant and decontamination of PCB contaminated equipment and materials. The groundwater remedy included activities to locate the source of VOCs, installation of additional wells to evaluate the extent of VOC contamination and groundwater monitoring. The ROD provided for development and implementation of additional remedial measures, if warranted, to ensure that groundwater was restored to Safe Drinking Water Standards, known as Maximum Contaminant Levels (MCLs), or a 10^{-6} risk level. In May 1990, a Remedial Design/Remedial Action (RD/RA) Consent Decree was entered into by EPA and the Site owners, TBG, Inc. and Indian Head Industries, Inc.

An Explanation of Significant Differences (ESD) was issued in August 1995, stating that soil containing less than 100 ppm of PCBs and located at least 15 feet below ground surface would be left in place due to impracticability of removal. A Voluntary Covenant and Agreement to restrict land use on the Site was recorded in July 1995. The ESD also identified natural attenuation as the groundwater cleanup option.

The remedies selected in the ROD and the ESD have been implemented, including the scope of work for remedial design and remedial action described in the 1990 Consent Decree.

Ongoing activities relating to the groundwater remedy include semi-annual groundwater monitoring for VOCs. The objective of the groundwater sample collection is to monitor the dissipation (through natural attenuation) and position of the VOC plume until analyses from six consecutive sampling events indicate that the concentrations of VOCs in groundwater have achieved the MCLs as specified in the Consent Decree.

1.0 Introduction

The United States Environmental Protection Agency (EPA) has conducted the first five-year review of the remedial action implemented at the MGM Brakes Superfund Site (also referred to as “MGM Brakes” or “the Site”) located at the south end of Cloverdale, California, west of Highway 70. CH2M HILL was contracted under EPA Region IX's Response Action Contract to prepare this report, which documents the results of the five-year review.

The five-year review process evaluates whether the remedial measures implemented at the Site are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify any deficiencies found during the review and provide recommendations for addressing these deficiencies.

By statute, EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), as amended, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the Site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

Consequently, this five-year review was performed because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unrestricted use and unlimited exposure.

This is the first five-year review for the MGM Brakes Site. The August 1995 ESD triggered the statutory review.

2.0 Site Chronology

Table 2-1 provides a chronology of events at the Site.

Table 2-1: Chronology of Site Events

Date	Event
August 1981	NCRWQCB and CDFG inspect MGM Brakes facility and note presence of oil-stained soil.
September 1981	IT Corporation reports that oily soils contain PCBs.
November 1981	Harding Lawson and Associates (HLA) is contracted by the Potentially Responsible Parties (PRPs) to investigate the extent of PCB soil contamination on the site.
November 1981	HLA prepares a proposed sampling program in accordance with NCRWQCB cleanup and abatement order No. 81-216.
November 1981-June 1983	HLA collects soil, surface water, and groundwater samples at MGM Brakes Site and the surrounding property. Kennedy Jenks Engineers (KJ) is contracted by PRPs to collect additional samples.
April 1982	HLA performs a seismic refraction study and submits a Remedial Action Plan.
June 1982	NCRWQCB and California Department of Health Services (DOHS) reviews HLA Remedial Action Plan and submits comments.
September 1982	In response to NCRWQCB and DOHS comments on the Remedial Action Plan, HLA performs additional sampling and submits a Revised Remedial Action Plan to the NCRWQCB and DOHS.
July 1983	In response to additional sampling requests by DOHS and NCRWQCB to determine the full extent of PCB contamination and to further characterize the subsurface geology and hydrology, HLA resubmits the Revised Remedial Action Plan on July 15.
October 1983	Kennedy Jenks (KJ) prepares draft report: <i>On-site Remedial Action</i> .
December 1983	KJ collects additional groundwater samples.
May-October 1984	KJ collects additional groundwater samples.
June 1984	Kennedy Jenks Chilton (K/J/C) prepares draft feasibility study (FS) based on previous investigations and submits it to DOHS and EPA.
October 1984	EPA and DOHS provide comments on K/J/C draft FS and request that the FS be revised to comply with minimum requirements.
November 1984	PRPs decline to prepare revised FS.
1985	EPA contracts GCA Technology, Inc. (GCA) to prepare an endangerment assessment and FS.
September 1986	GCA FS is released for public comment.
September-November 1986	Public comment period on proposed cleanup plan.

Table 2-1: Chronology of Site Events

Date	Event
1987	EPA contracts Camp Dresser & McKee Inc. (CDM) to revise the GCA FS to meet new requirements of the Superfund Amendments and Reauthorization Act (SARA) and to address adverse public comments received on the 1986 proposed cleanup plan.
1987-1988	To complete the database established by the first FS and to evaluate trichloroethylene (TCE) contamination, CDM performs surface soil sampling, groundwater sampling, and split sampling with the PRP consultants. CDM also reviews PRP consultants' PCB air monitoring efforts and treatability study programs.
June 1987	K/J/C and International Waste Technologies conduct bench-scale fixation test of MGM Brakes' contaminated soil.
September-December 1987	K/J/C and Galson Research conduct laboratory-scale testing of PCB dechlorination using an alkaline polyethylene glycol mixture.
April 1988	Revised FS issued.
May 1988	Proposed Plan issued.
May-June 1988	Public comment period on revised FS and Proposed Plan.
September 1988	Record of Decision (ROD) for cleanup of soil and groundwater is issued for the Site.
May 1990	Consent Decree for remedial design/remedial action (RD/RA) entered by the district court with TBG, Inc. (TBG) and Indian Head Industries, Inc. (IHII) agreeing to conduct the work.
March 1991	TBG and IHII conduct further investigation and characterization of soil and groundwater contamination.
July-November 1991	Installation and sampling of additional groundwater monitoring wells.
October 1991	Sampling and classification of equipment remaining inside the casting plant building in order to prepare for demolition.
December 1991-January 1992	Dismantling and equipment removal from the casting plant building for final disposal.
April 1992	Casting plant building demolition begins.
September 1992	Prefinal Inspection of casting plant building demolition conducted.
November 1992	TBG and IHII submit <i>Draft Prefinal Inspection Report</i> for building demolition work to EPA.
February 1993	Soil excavation work begins.
January 1994	Prefinal inspection of soil excavation conducted.
July 1994	TBG and IHII submit proposed <i>Final Prefinal Inspection Report</i> for the excavation work to EPA.
October 1994	TBG and IHII submit <i>Final Prefinal Inspection Report</i> for excavation work to EPA.

Table 2-1: Chronology of Site Events

Date	Event
April 1995	<i>Final VOC Groundwater Monitoring Plan</i> prepared by Erler & Kalinowski, Inc. (EKI) and submitted to EPA.
July 1995	Recording of voluntary covenant and agreement to restrict use of MGM Brakes property.
August 1995	Explanation of Significant Differences (ESD) modifying the 1988 ROD by leaving certain PCB-contaminated soils in place, imposing land-use restrictions, and identifying natural attenuation as groundwater cleanup option.
Late 1994-Early 1995	EPA samples surface water runoff from Site to ensure that there is no surficial migration of contamination.
September 1994-March 1998	Quarterly groundwater monitoring of on- and off-site wells.
March 1998	EPA issues certificate of completion for demolition and excavation work.
March 1998	EPA agrees to amend the 1995 Final VOC Groundwater Monitoring Plan to terminate analysis of pesticides and semivolatile organic compounds (SVOCs), to no longer require sampling at Well B-74, and to reduce sampling frequency from quarterly to semi-annual.
March 1998-present	Semi-annual groundwater monitoring of on- and off-site wells.
August 1999	EPA agrees to allow for termination of analysis for PCBs in groundwater.
July 2000	Monitoring well B-74 plugged and abandoned.
June 2003	EPA conducts site inspection for five-year review.

3.0 Site Background

3.1 Physical Characteristics

The MGM Brakes Superfund Site is an approximately 5-acre area located in Sonoma County, in the southern portion of the city of Cloverdale, California. Cloverdale is located in the Alexander Valley approximately 80 miles north of San Francisco. The Site is located at the southwest corner of the intersection of Donovan Road and South Cloverdale Boulevard (former Highway 101), as shown in Figure 1. Cloverdale is an agricultural community of approximately 4,500 residents (USEPA, 1986). The Site is located less than one mile west of the Russian River but is not within the 100-year flood zone. The site is essentially flat, and the only features that currently remain are a fence surrounding the former casting plant and asphalt pavement located in the northeast corner. Adjacent property consists mainly of residential houses and office buildings, as shown on Figures 2 and 3.

3.2 Land and Resource Use

Prior to 1961, 22 acres of land including the five acres which comprise the MGM Brakes Site was an Indian reservation. From 1962 until operations ceased in 1982, the MGM Brakes facility manufactured and cast aluminum brake components for large motor vehicles. The facility consisted of a casting plant building, seven above ground tanks, a cooling tower, and a storage shed.

All buildings and related appurtenances have been removed from the site as part of the remedial action. A Voluntary Covenant and Agreement was recorded in Sonoma County on July 12, 1995 to restrict use of those portions of the Site where contaminated soil was left in place. The Site is fenced with the exception of the southeast corner due to new construction on the adjacent property. The Site is currently vacant and available for sale.

The groundwater aquifer underlying the Site is used as a public drinking water source. This water is provided by the South Cloverdale Water Company and is collected from two wells located $\frac{1}{2}$ to $\frac{3}{4}$ miles upgradient and to the east of the Site. The drinking water from these wells is treated by chlorination and serves approximately 40 homes near the Site. No downgradient water supply wells have been identified.

According to site-specific groundwater investigations the dominant groundwater flow direction is to the south-southeast. The hydraulic gradient in this direction, measured by slug testing, is about 0.014 foot per foot during winter and about 0.012 foot per foot during summer (HLA, 1982). Surface drainage from the Site flows south-southeast along a ditch paralleling South Cloverdale Boulevard toward the nearest surface water body, Icaria Creek, which ultimately flows into the Russian River. The Russian River is approximately 1 mile east of the Site.

3.3 History of Contamination

From 1962 until operations ceased in 1982, the MGM Brakes facility manufactured and cast aluminum brake components for large motor vehicles. From 1965 to 1972 hydraulic fluids containing PCBs were used in the casting machines. These hydraulic fluids leaked from the

casting machines in the normal course of plant operations and were then collected, together with water used to cool the dies between castings, in floor drains. Following gravity separation of oils and grease, the wastewater containing PCBs was discharged, via a drain line, to the ground adjacent to the casting plant. The use of hydraulic fluid containing PCBs was gradually discontinued in 1973, but wastewater containing ethylene glycol (the hydraulic fluid later used in the casting machines) continued to be discharged in the same manner until 1981. The practice of discharging wastewater onto the vacant fields surrounding (mostly to the south) of the casting plant building is believed to be the main cause of contamination at the Site.

On August 11, 1981, the NCRWQCB and the CDFG conducted a site inspection in response to a citizen complaint. During the inspection they noted the presence of oily soil. In response to these observations, MGM Brakes personnel dug up the soil and stockpiled it on the Site. MGM then hired IT Corporation to dispose of the soil. Prior to disposal, IT sampled the waste and found that it contained PCBs. In response to these findings, Harding Lawson and Associates (HLA) conducted additional studies from 1981 to 1983. PCB contamination was detected in surface water runoff, surface and subsurface soil, and inside the casting plant building. Although groundwater was also tested at that time, PCBs were not detected (HLA, 1983). In 1986, volatile organic compounds (VOCs) were detected in the groundwater. These VOCs are listed in Section 3.5.

3.4 Initial Response

In November 1981, the State issued Cleanup and Abatement Order No. 81-216 which required MGM Brakes to cease discharge of contaminated wastewater and remove oily soil from the Site. In the fall of 1981, the stockpiled soil was transported to the Casmalia hazardous waste disposal facility in Santa Barbara County. In addition, the order required submittal and implementation of a remedial action plan and monitoring groundwater for the presence of PCBs (HLA, 1983). Soil, surface water and groundwater were collected, and a seismic refraction study was completed by Harding Lawson and Associates (HLA) in 1982. A remedial action plan was submitted to the State in April 1982. In response to State comments, subsequent actions to support the development of the remedial action plan included groundwater monitoring, collection of soil samples, installation of surface water runoff collection systems, initiation of a study to determine whether the spread of PCB contamination was caused by presence of solvents in soil, and cleanup of the MGM Brakes casting plant interior.

The Site was proposed for the National Priorities List (NPL) on December 30, 1982, and finalized on the NPL in September 1983. At that time, EPA assumed lead responsibility for oversight of Site investigation and cleanup activities.

EPA conducted limited field investigation during the course of evaluating remedial alternatives. The original EPA Feasibility Study (FS) was initiated during 1985 and released in 1986. The first FS identified incineration as the Agency's preferred alternative. Due to strong opposition to incineration as well as other comments submitted during the public comment period, EPA decided to prepare a revised FS. In May of 1988, EPA released the revised FS which evaluated a list of alternatives including capping, excavation and on-site fixation, in-situ fixation, on-site incineration, and excavation and off-site disposal. The preferred remedy announced in the May 1988 Proposed Plan was excavation and off-site

disposal. A 35-day public comment period followed in which no adverse comments were received.

3.5 Basis for Taking Action

The basis for taking action at the MGM Brakes Site was the releases of hazardous substances into the environment and the fact that the Site posed, or potentially posed, a threat to human health and the environment via inhalation, ingestion, and direct contact. Surface and subsurface soils contained PCBs, a probable human carcinogen, at concentrations up to 4,800 ppm. The concrete slab of the casting plant was contaminated with concentrations of PCBs up to 5,400 ppm. These values far exceeded the 10 ppm level that EPA established in 1988 as the national cleanup level for PCBs in residential soils.

VOCs were first detected in groundwater in 1986 with concentrations ranging from less than 0.5 to 190 parts per billion (ppb). The detected VOCs were benzene, chlorobenzene, cis-1,2-DCE, 1,4-DCB, 1,1-DCE, 1,1,1-TCA, TCE, and vinyl chloride. DCE and TCE are probable human carcinogens. Vinyl chloride and benzene are known human carcinogens. The benzene, TCE and vinyl chloride exceeded their respective MCLs at the time of the 1988 ROD. When the 1995 ESD was published, TCE was the only contaminant that continued to exceed MCLs.

4.0 Remedial Actions

The following sections summarize the remedial actions selected, remedy implementation and operation and maintenance of remedial systems.

The ROD for the Site was signed on September 29, 1988. The selected remedy addressed soil and groundwater as one sitewide operable unit. The soil remedy portion was addressed in two separate parcels, as follows:

- Parcel 1: PCB-contaminated soil exclusive of that beneath the MGM Brakes processing building (casting plant) and corresponding concrete slab.
- Parcel 2: Contaminated soil and concrete beneath the casting plant building.
- Groundwater up to the Site boundary. Site boundary is defined as wherever groundwater contamination has come to be located.

As stated in the ROD, the selected remedies were intended to reduce the present and future on-site risk to human health and the environment to a 1×10^{-5} (1 in 100,000) cancer risk and provide unrestricted future use of the property. This was to be achieved by removing and disposing off-site all soil exceeding a PCB concentration of 10 ppm. The ROD also included further investigation of the VOC-contaminated groundwater and restoration of groundwater up to the Site boundary to appropriate MCLs (EPA, 1988).

The 1995 ESD slightly altered the soil remedy to allow for some PCB contamination less than 100 ppm and at least 15 feet below ground surface to remain onsite and to impose land-use restrictions for those contaminated soil areas. A Voluntary Covenant and Agreement to restrict land use was recorded in Sonoma County on July 12, 1995. The ESD selected natural attenuation as the groundwater remedy and defined the leading edge of the groundwater plume as the Point of Compliance (POC). The POC was to be used to ensure that contaminants did not move beyond the boundary line (the POC) at concentration levels greater than MCLs. (EPA, 1995a).

In a May 1990 Consent Decree (CD) entered into with EPA, the Settling Defendants, TBG Inc., and Indian Head Industries, Inc., agreed to perform the remedial design/remedial action and pay past costs for cleaning up the Site. The Remedial Design was conducted in conformance with the ROD as modified by the ESD.

4.1 Soil

The following section outlines remedial actions implemented in compliance with the ROD, Consent Decree, and ESD pertaining to contaminated soils in Parcels 1 and 2. The soil remedial activity was divided into two parts: demolition work and excavation work.

4.1.1 Demolition Work

In order to access the contaminated soil and concrete beneath the casting plant building and other structures (Parcel 2), it was determined that building demolition must be performed.

The casting plant building was comprised of two adjoining structures: one structure consisting of wood and concrete and one structure consisting of steel columns and beams

with sheet metal siding with internal metal partitions. Both structures had cast-in-place concrete flooring. Floor removal was not part of the demolition work. The other on-site structures included seven aboveground tanks, a cooling tower, and a storage shed.

Demolition work began with the wood and concrete structure in April 1992. To comply with health and safety requirements, both dust control measures and air sampling and analyses were used during the process. Any piles of debris created were covered with visqueen and anchored with cinder blocks at the end of each day. The air sampling included both personal and perimeter monitoring. Demolition of the metal structure was completed in May 1992. The building debris was sampled for PCBs, found to be hazardous and subsequently shipped off site to Kettleman Hills Class I Landfill.

All demolition equipment, such as front-end loader, Bobcat, etc. was decontaminated with high-pressure hoses. The decontamination water was collected at the decontamination pad site (Figure 3) and placed in 55-gallon drums using a vacuum. This water was then run through the on-site treatment plant.

Some fluids were generated while conducting the demolition work including contents of the five aboveground tanks and the cooling tower, as well as decontamination water. All were sampled and analyzed prior to discharge, off-site disposal or treatment.

In September 1992, the concrete pad comprising the floor of the casting plant building and the drainage trenches were covered with a temporary cap of asphalt emulsion. The demolition work was completed in the Fall of 1992.

4.1.2 Excavation Work

The excavation work was performed to remove and dispose PCB-contaminated soil from both Parcel 1 and Parcel 2 at the Site. Soils contaminated above 10 ppm were to be excavated to a depth of at least five feet for most of the Site, with limited highly contaminated areas being excavated to 29 feet. The work began with demolition and excavation of the concrete building pad on June 9, 1993. To comply with health and safety requirements, both dust control measures and air sampling and analyses were used during the process. Dust control measures consisted of spraying the areas of excavation as needed using a water truck, spray hoses, and sprinklers. All concrete was hauled off-site on the day it was excavated.

There were several below-grade structures that were removed as part of this excavation work. These included a small underground metal tank, two concrete sumps, three concrete pipes, and other associated underground piping.

Prior to excavating the soils, it was necessary to lower the water table in the area of deep excavation (i.e., where the highest levels of PCBs were found at lower depths below ground surface). Twenty-seven extraction wells were installed to pump groundwater to an on-site treatment plant using granular-activated carbon as the treatment media (see Figure 4). The dewatering began in April 1993 and was discontinued in October 1993. The local water table was lowered to approximately 30 feet below ground surface. While the dewatering was ongoing, excavation of soil and concrete started in June 1993. Excavation would occasionally stop while verification sampling and backfilling with clean soil took place.

While conducting the excavation work (more than 900 grid squares were identified for excavation), some bedrock was encountered that required modification of the 1988 ROD.

Due to difficulty excavating bedrock, TBG and IHII proposed to leave bedrock in place if it: (1) contained less than 100 ppm of PCBs and (2) was at least 15 feet below ground surface. The result of this action was that in 11 grid squares (12.5 feet by 12.5 feet) the remedial goal for PCB was not met. These grid locations are noted in the voluntary covenant that documents the restricted use of the property. The grids (sample locations) can be found in Figure 8 of the *Proposed Final Prefinal Inspection Report for the Excavation Work* dated July 1, 1994 prepared by Erler & Kalinowski, Inc. A copy of this figure is in Appendix F of this report.

Upon completion of the excavation and backfilling with soil containing less than 1 ppm PCB, stockpiled soil, debris, and other appurtenances were removed from the Site and disposed of at facilities appropriate to the material. The extraction wells were abandoned in accordance with applicable regulatory requirements. All excavation field work was completed by June 1994.

4.1.3 Certificate of Completion for the Demolition and Excavation Work

Complete documentation of all work related to both demolition and excavation was provided to EPA by TBG and IHII, through their contractor Erler and Kalinowski, Inc. (EKI) in a letter dated January 30, 1998. The key reference documents that satisfy the remedial action for soils are:

- *Equipment Disposal Final Report*, November 22, 1992
- *Draft Prefinal Inspection Report, Building Demolition Work*, November 30, 1992
- *Proposed Final Prefinal Inspection Report for the Excavation Work*, July 1, 1994
- *Draft Prefinal Inspection Report No. 2 for the Excavation Work*, September 12, 1994
- *Draft Final Monitoring Report for the Excavation Work*, September 3, 1997

In March 1998, the EPA provided a Certificate of Completion for the demolition and excavation work, which documents EPA's concurrence that all portions of the remedial action for soil were completed in accordance with the ROD and the Consent Decree.

4.2 Groundwater

The following section outlines groundwater remedial actions implemented in accordance with the ROD and ESD.

The 1988 ROD specified that groundwater cleanup would achieve concentrations at or below maximum contaminant levels (MCLs) or other health-based standards, as well as a 10^{-6} risk level to the site boundary. The remedy included activities to locate the source of VOCs, installation of additional wells to evaluate the extent of VOC contamination and groundwater monitoring. The ROD provided for development and implementation of additional remedial measures, if warranted, to ensure that groundwater was restored to MCLs.

The August 1995 ESD selected natural attenuation as the groundwater remedy and defined a Point of Compliance (POC). The POC was to be used to ensure that contaminants did not move beyond the boundary line (the POC) at concentration levels greater than MCLs (EPA 1995a).

The initial remedial action for groundwater was quarterly monitoring for VOCs and annual monitoring for semivolatile organic compounds (SVOCs) and PCBs in 12 wells. VOCs, PCBs, and SVOCs were analyzed according to EPA Methods 8010 and 8020, EPA Method 8080, and EPA Method 8270, respectively. These requirements were based on the April 1995 VOC monitoring plan. Currently, the requirements for monitoring are substantially reduced based upon submittals made to EPA by EKI, on behalf of TBG and IHII.

Over time, EPA has allowed for:

- Discontinuing analysis of SVOCs and PCBs due to sustained results which are less than the detection limit for these parameters.
- Termination of sampling upgradient well B-74 (groundwater elevation levels continue to be measured). Figure 5 depicts all of the well locations.
- Reduction of sampling frequency from quarterly to semi-annually (April and October of each year).

The modified groundwater monitoring requirements are:

- Semi-annual monitoring for VOCs using EPA Method 8260 in 11 wells.

This groundwater monitoring will continue until such time that MCLs for each constituent are reached at all sampling points within the contamination plume and at the point of compliance (Site boundary line). TCE is the only VOC that still exceeds its MCL of 5 ppb.

4.3 System Operation and Maintenance

Annual Operation and Maintenance (O&M) costs are approximately \$21,000 per year. Costs include groundwater monitoring well sampling, analysis, data validation and reporting.

5.0 Five-year Review Process

The MGM Brakes five-year review was led by Janet Rosati, the EPA Remedial Project Manager for the Site. EPA received technical support from CH2M HILL.

The five-year review consisted of a review of relevant documents (Appendix A) and a regulatory review (Appendix B). A Site inspection was performed on June 13, 2003. The inspection checklist is found in Appendix C and photographs from the inspection are presented as Appendix D. It was determined that interviews were not needed as part of this review. As part of this Five-Year review, a screening-level ecological risk assessment (SLERA) was prepared. The SLERA was conducted to determine if there were any remaining risks to the environment posed by past and present activities at this Site (Appendix E).

Following the release of this document, EPA will produce and distribute a fact sheet to the community near the site. The fact sheet will summarize the findings of the five-year review and instructions on how to access a copy of the review.

5.1 Document Review

As a part of the five-year review process, CH2M HILL conducted a brief review of numerous documents related to Site activities. The documents chosen for review primarily focused on actions that have occurred during the past 5 years but ranged in publication date from 1988 to the present. Appendix A provides a list of the reviewed documents.

5.2 Regulatory Review

This section provides a review of applicable or relevant and appropriate requirements (ARARs) and other standards to be considered (TBCs) for the selected remedy at the MGM Brakes Superfund Site. "Applicable" requirements are standards and other substantive environmental protection requirements promulgated under federal and state law that specifically address a circumstance at a CERCLA site, such as a hazardous substance, pollutant, contaminant, remedial action, or location. "Applicability" implies that circumstances at the site satisfy all jurisdictional prerequisites of a requirement. "Relevant and appropriate" requirements are standards and other substantive environmental protection requirements promulgated under federal or state law that address situations sufficiently similar to a CERCLA site to be of use. "Relevance" implies that the requirement regulates or addresses situations sufficiently similar to those found at the MGM Brakes Site. "Appropriateness" implies that the circumstances of the release or threatened release are such that use of the standard is germane.

TBCs are non-promulgated federal or state advisories or guidelines that are not legally binding and do not have the status of ARARs. However, TBCs may play an important role in the development of site-specific cleanup standards.

The ARARs presented in the September 1988 ROD were reviewed for any changes, additions or deletions. An ESD issued in August 1995 was also reviewed to identify any changes to ARARs.

The comprehensive regulatory review of all ARARs is attached as Appendix B. The result of the review is that there are no significant changes that have occurred in the regulations since issuance of the ROD and ESD that would effect the protectiveness of the remedies.

5.3 Site Inspection

Representatives of EPA, EKI, and CH2M HILL participated in a site inspection on June 13, 2003. The inspection included a walk of the Site and surrounding properties, as well as gathering plants to be used in preparing the screening-level ecological risk assessment (SLERA). Also in support of the SLERA, the site inspection team observed animal habitats both on and around the Site. A summary of the inspection findings is presented below. The Site inspection checklist and photos are provided in Appendices C and D, respectively.

The Site is an open field surrounded by a fence. Asphalt pavement covers the northeastern corner of the Site, a remnant of the former parking lot and pad for the treatment plant constructed during remedial action activities. Drainage ditches that have been covered with asphalt border the northeastern fence lines. Along the southern fenceline it was noted that some of the fence was in disrepair allowing for access to the site by trespassers. There are no signs indicating that the Site is a Superfund site. The only sign posted is a "For Sale" sign.

A new office building and parking lot have recently been constructed within the parcel located to the south of the MGM Brakes property. Groundwater monitoring wells B-71-1, B-75 and B-76 are located on this property.

6.0 Technical Assessment

6.1 Functioning of the Remedy as Intended by Decision Documents

All soil remedial actions have been completed, as mandated in the ROD, ESD, and Consent Decree. The soil remedial action which consisted of demolition, excavation, and placement of clean fill was completed to the satisfaction of EPA as documented in the March 25, 1998 Certificate of Completion. A total of eleven grid squares (12.5 feet by 12.5 feet) of contaminated soil that contained less than 100 ppm of PCBs and was at least fifteen feet below ground surface was left in place. A voluntary Covenant and Agreement, recorded with Sonoma County, restricts excavation of these portions of the property.

The requirement for semi-annual monitoring for VOCs continues in eleven wells. TCE continues to be detected above the MCL in two wells. Reporting for the semi-annual (conducted every April and October) groundwater monitoring continues as specified per the revised Final VOC Groundwater Monitoring Plan (EKI, 1995).

6.2 Current Validity of Assumptions Used During Remedy Selection

The assumptions used to select and implement the remedy are generally unchanged for all areas contaminated with chemicals identified at the time of the 1988 ROD and the 1995 ESD. No standards have been changed that would effect the protectiveness of the remedy. No changes in exposure pathways have been identified.

6.3 Recent Information Affecting the Remedy

All remedial activities related to cleanup of soils were completed in 1994. EPA certified completion of soil remedial activities in 1998. Recent activity includes groundwater monitoring, which is required as part of the groundwater remedy, with the latest semi-annual sampling event being conducted in April 2003. The event included measurement of water levels and collection of groundwater samples and analysis for volatile organic compounds from eleven wells. A letter report summarizing the results of this most recent sampling event was submitted to the EPA and the California Regional Water Quality Control Board on June 10, 2003.

Prior to sampling wells B-31, B-45R, B-50, B-71-1, B-72-1, B-73, B-75, B-76, B-77A, B-77B and B-78 on April 1, 2003, water elevations in each well were measured. This data was used to prepare a groundwater elevation contour map, presented as Figure 5. Groundwater elevation contours indicate the direction of groundwater flow is generally to the southeast. It should be noted that water elevation data taken from well B-77B is not included in generating the groundwater elevation contours because it is screened in a deeper zone (bedrock) than all of the other wells.

Groundwater sampling took place on April 1 and 3, 2003 from all eleven wells. The samples were analyzed by Sequoia Analytical in Petaluma, California, for VOCs by EPA Method 8260 in accordance with the revised Final VOC Groundwater Monitoring Plan (EKI, 1995)

and any approved modifications. April 2003 groundwater sampling results were consistent with that of previous events. TCE was detected above the cleanup goal of 5 ppb in wells B-50 and B-73 in April 2003 and below the cleanup goal in all other wells. A TCE concentration contour map for April 2003 is presented in Figure 6. All other VOC constituents were either below their associated cleanup goal or were not detected in all of the wells.

The groundwater remedy of natural attenuation selected in the 1995 ESD requires monitoring to continue until levels are at or below the MCLs for six consecutive quarters, followed by annual monitoring showing levels at or below MCLs for five consecutive years within the established boundary line (point of compliance). The April 2003 sampling event results show that monitoring must continue since the MCL for TCE is exceeded in two of the wells. TCE was either below the detection limit or below MCL for all other wells.

The screening-level ecological risk assessment (SLERA) conducted as part of the five-year review process for this Site revealed that there is little or no potential risk to ecological receptors that are currently using the Site or may use the Site in the future. The comprehensive SLERA report is found in Appendix E.

7.0 Conclusions and Recommendations

The following sections summarize conclusions and recommendations from the five-year review. Where follow-up action is required, the follow-up action to be conducted and the proposed date for completion are discussed.

7.1 Issues Identified and Recommended Follow-up Actions

The concentration of TCE in groundwater continues to exceed the MCL in two point of compliance wells as of April 2003. Therefore groundwater monitoring will need to continue as per the revised Final VOC Groundwater Monitoring Plan (EKI, 1995). The next semi-annual groundwater monitoring will take place in October 2003.

As noted during the June 2003 site inspection, the southern fence line is in disrepair and no sign is posted indicating that the property is a Superfund site. The fence will be repaired and a sign posted on the entry gate to the Site.

8.0 Protectiveness Statements

The soil remedy at MGM Brakes Superfund Site is protective of human health and the environment since the exposure pathway for inhalation and ingestion has been removed due to a combination of excavation, offsite disposal and placement of clean fill material. A total of eleven grid squares (12.5 feet by 12.5 feet) of contaminated soil that contained less than 100 ppm of PCBs and was at least fifteen feet below ground surface was left in place. A voluntary Covenant and Agreement, recorded with Sonoma County, restricts excavation of these portions of the property. The groundwater remedy, natural attenuation of VOCs, is expected to be protective upon completion by achieving levels at or below MCLs, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The 1995 ESD estimated that groundwater cleanup levels would be reached in seven years. Concentration of TCE in groundwater continue to decline and it is expected that cleanup goals will be reached within the next five years.

In order to insure the remedy continues to be protective of human health and the environment and is not compromised in any way, another review will be conducted within 5 years of the completion of this five-year review report, by 2008.

Figures

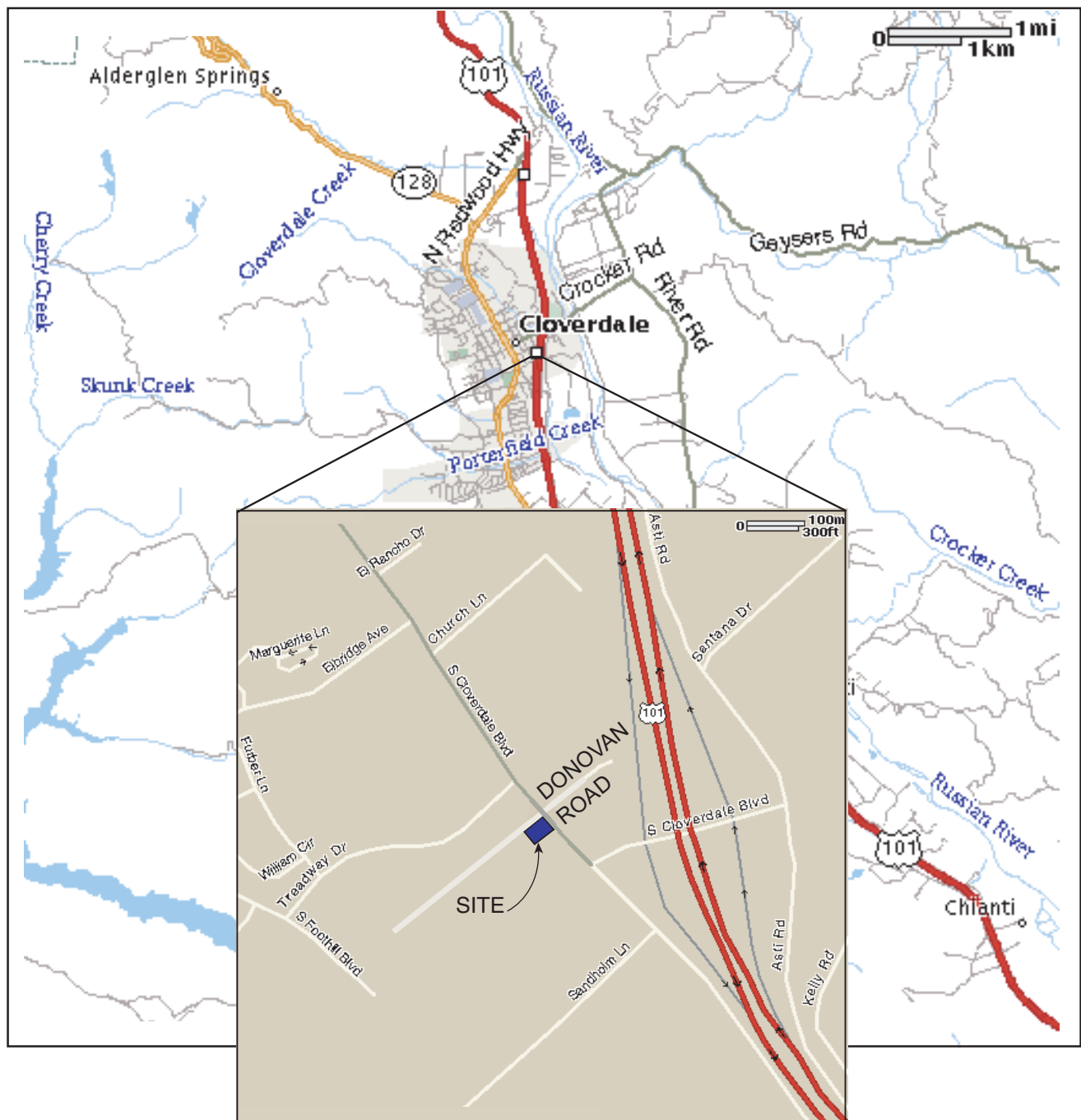
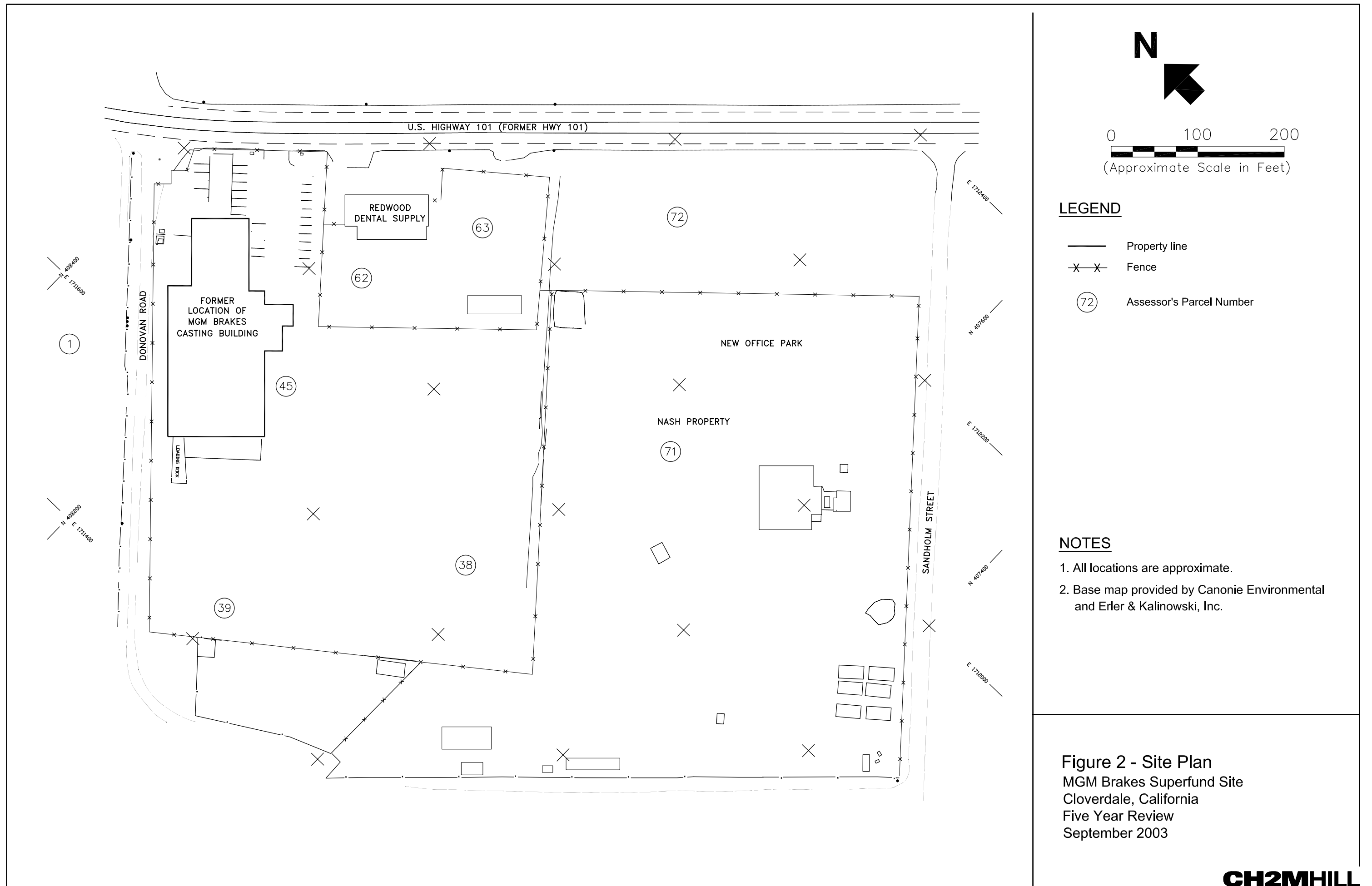
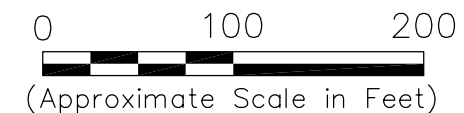
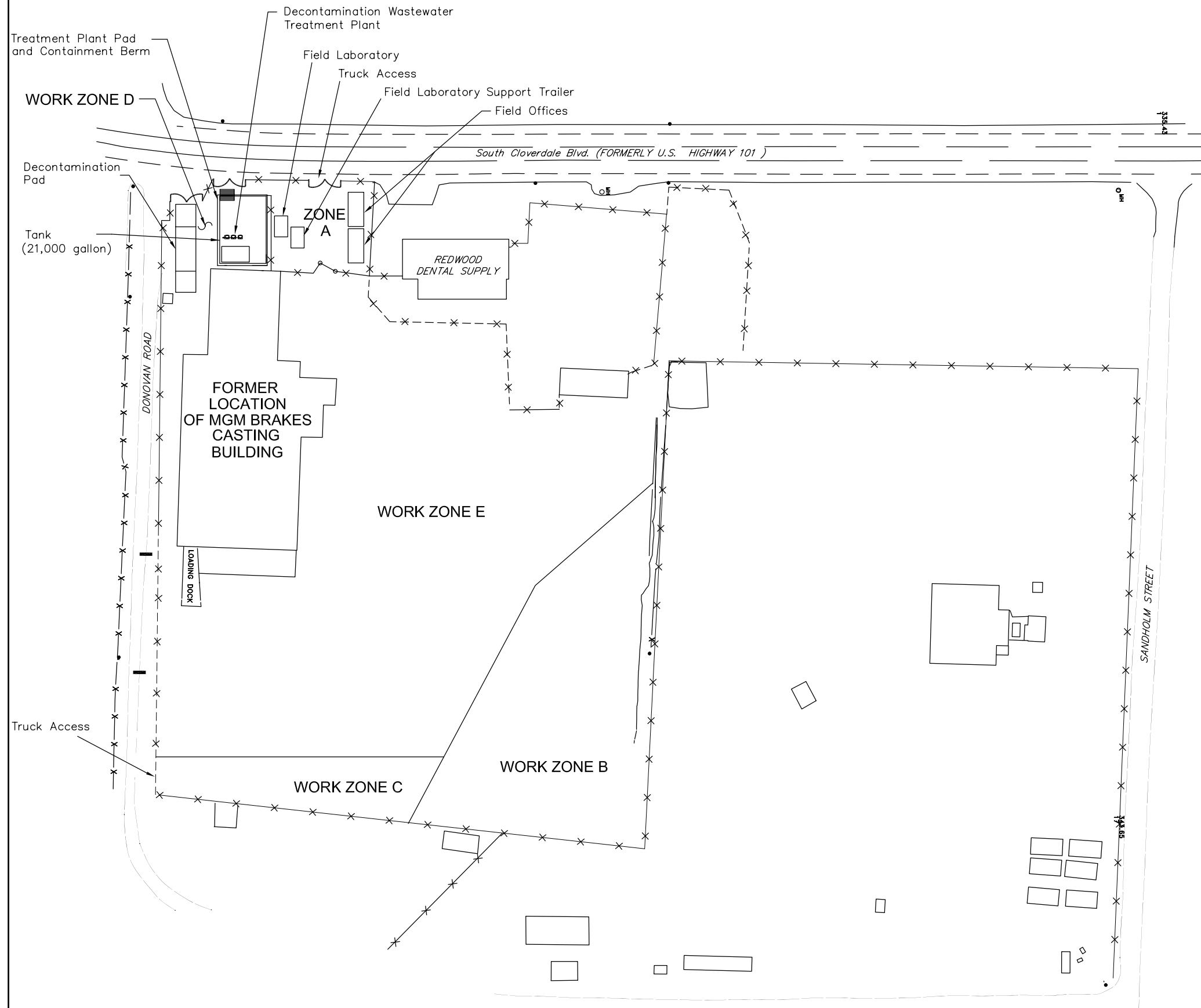


Figure 1 - Site Location
MGM Brakes Superfund Site
Cloverdale, California
Five Year Review
September 2003





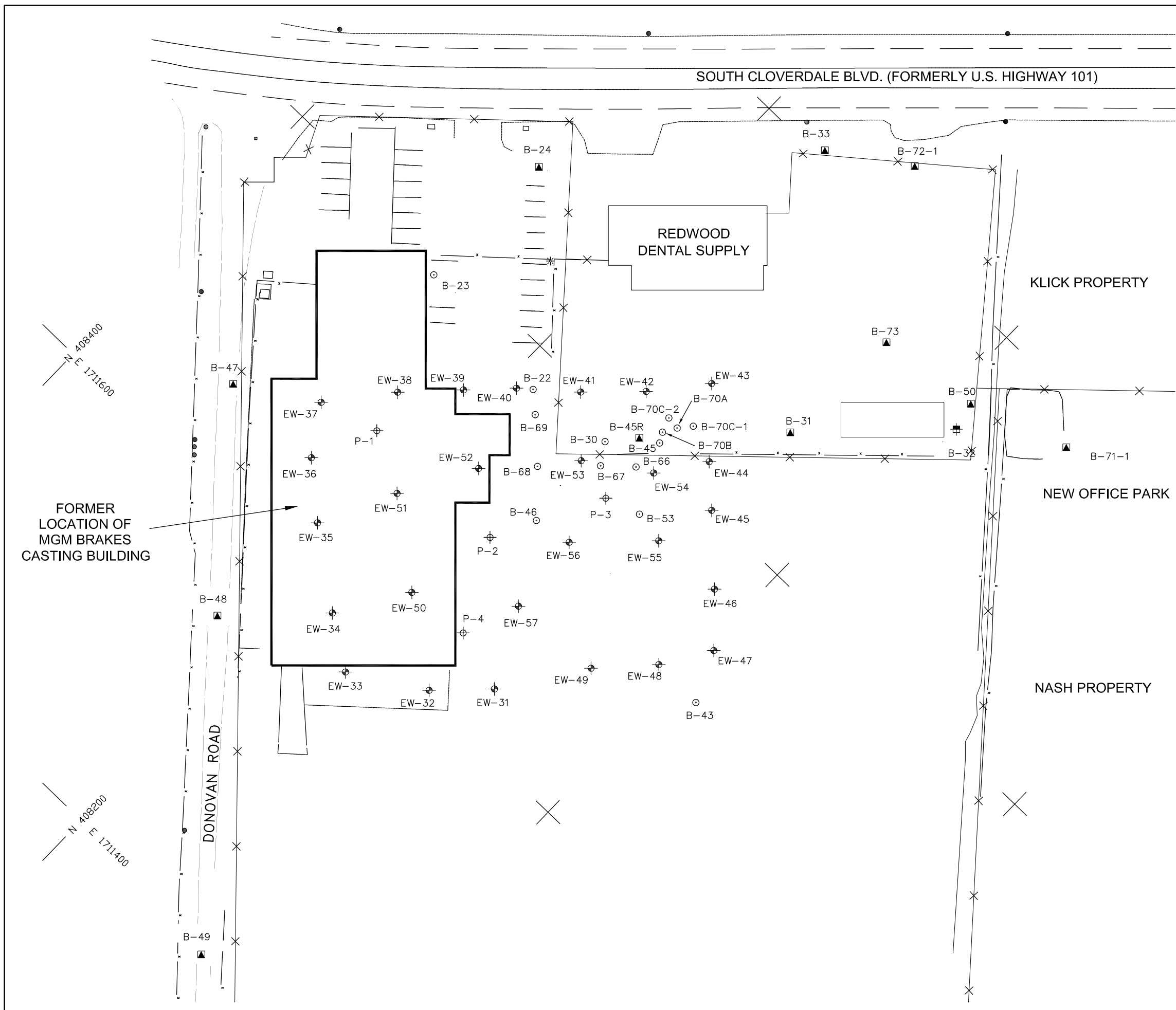
LEGEND

- x — x — Fence
- - x - - x - Movable Temporary Fence

NOTES

1. All locations are approximate.
2. Base map provided by Canonie Environmental and Erler & Kalinowski, Inc.

Figure 3 - Work Zones for
Excavation Work
MGM Brakes Superfund Site
Cloverdale, California
Five Year Review
September 2003



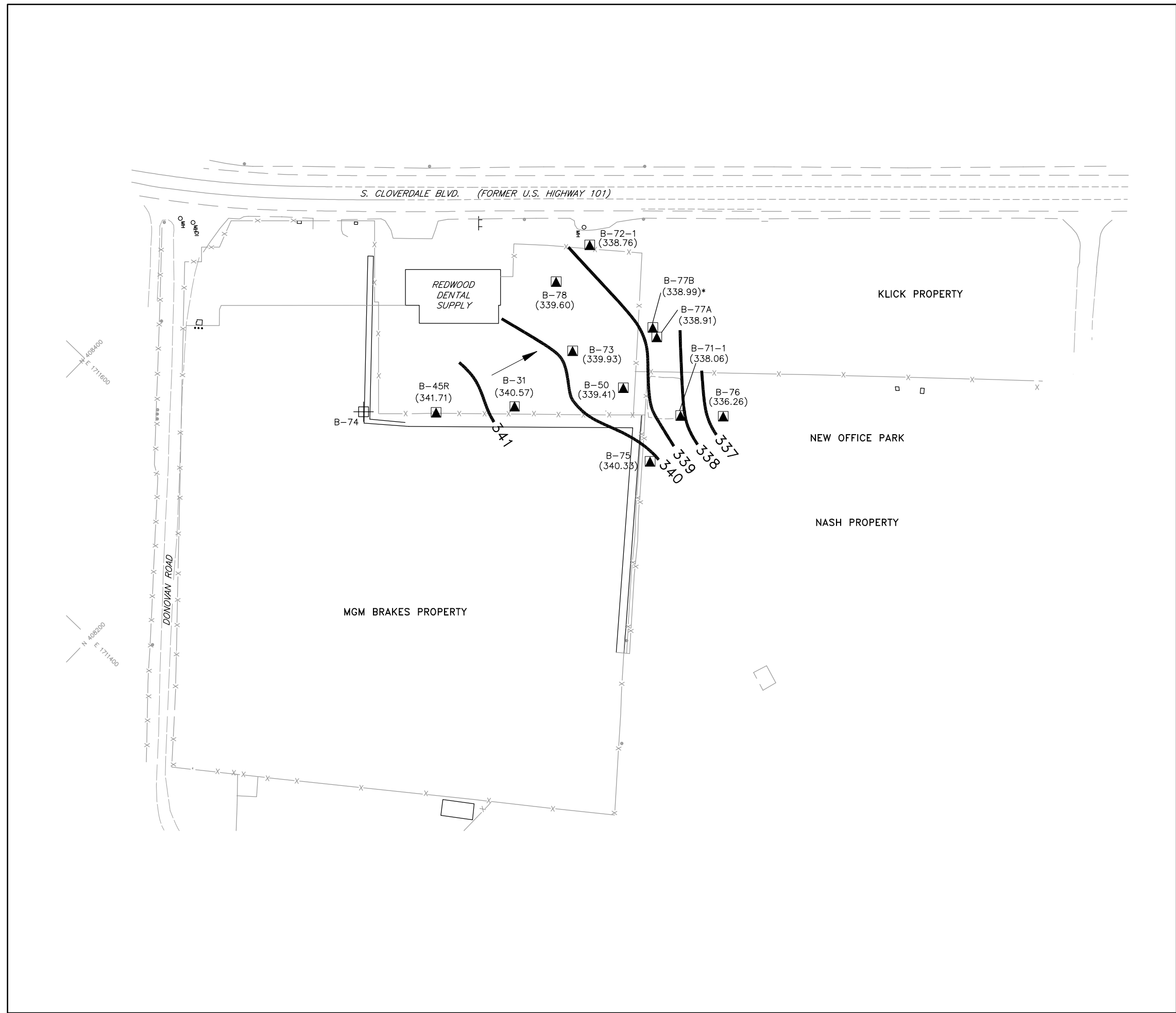
LEGEND

- Property line
- Fence
- Monitoring Well
- Well abandoned prior to excavation work
- Well abandoned in accordance with the Approved Final Excavation Plans and Specifications. Abandonment completed in Spring 1994.
- Groundwater Extraction Well
- Piezometer

NOTES

- All locations are approximate.
- Base map provided by Canonie Environmental and Erler & Kalinowski, Inc.

Figure 4 - Locations of Groundwater Monitoring and Extraction Wells & Piezometers
MGM Brakes Superfund Site
Cloverdale, California
Five Year Review
September 2003



LEGEND

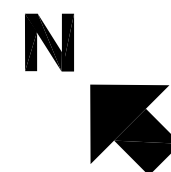
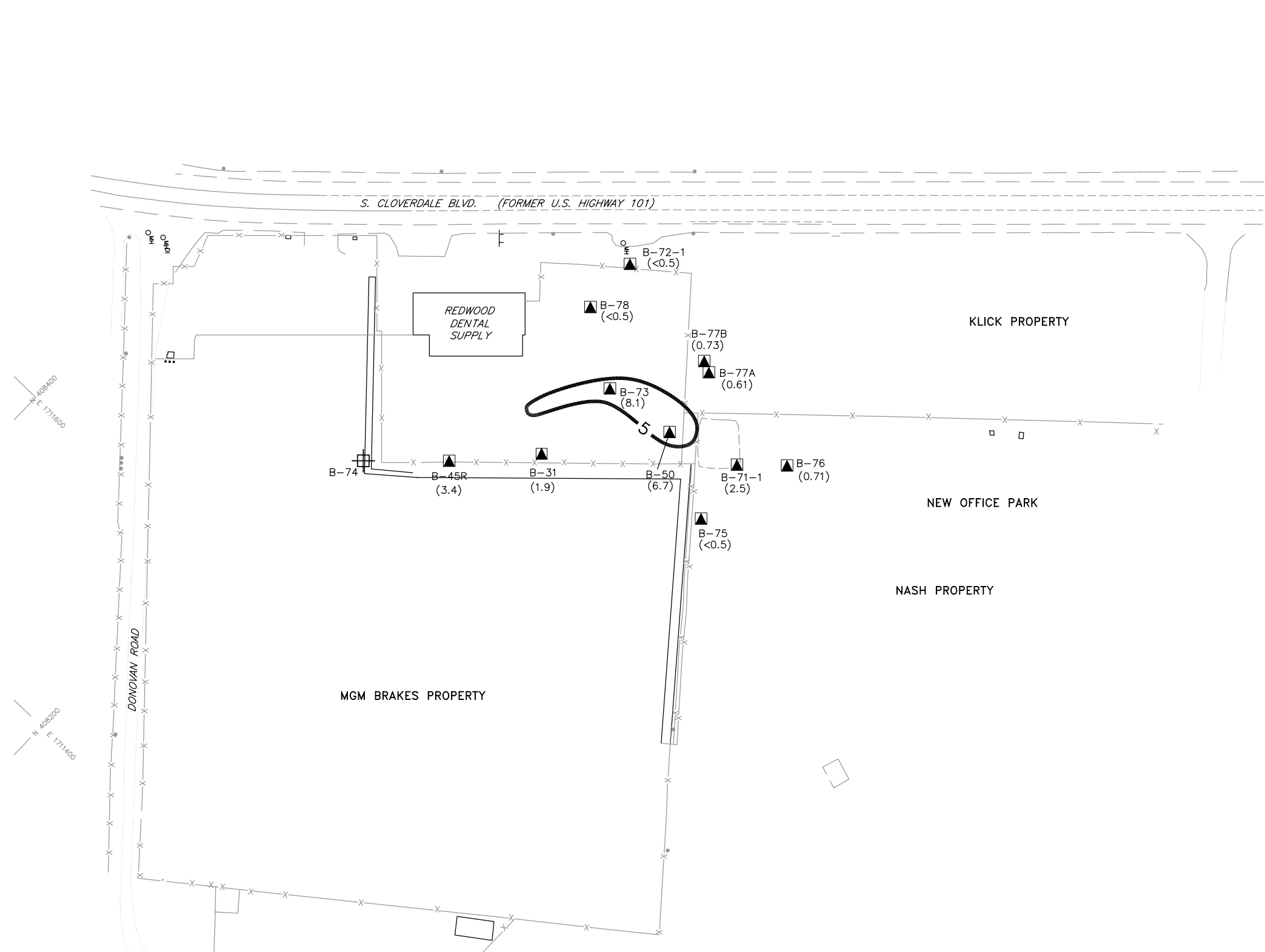
- ▲ Monitoring Well Location
- ⊕ Destroyed Monitoring Well
- x-x-x- Fence
- (334.55) Water Level in Feet Above Mean Sea Level
- 340— Groundwater Elevation Contour
- Groundwater Flow Direction

NOTES

1. All locations are approximate.
2. Base map provided by Canonie Environmental & Erler & Kalinowski, Inc.
3. Groundwater elevations measured 1 April 2003.
4. * = not included in potentiometric surface map.




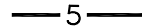
Figure 5 - Groundwater Elevation Contours

MGM Brakes Superfund Site
Cloverdale, California
Five Year Review
September 2003



0 100 200
(Approximate Scale in Feet)

LEGEND

-  Monitoring Well Location
-  Destroyed Monitoring Well
-  Fence
-  5 TCE Concentration Contour (ug/L)

NOTES

1. All locations are approximate.
2. Base map provided by Canonie Environmental and Erler & Kalinowski, Inc.
3. (20) TCE concentration in ug/L detected by Sequoia Analytical Laboratory in groundwater samples collected in April 2003.

Figure 6 - TCE Contours
MGM Brakes Superfund Site
Cloverdale, California
Five Year Review
September 2003

Appendix A

Documents Reviewed

APPENDIX A

Documents Reviewed

- Camp Dresser & McKee Inc. 1987. *Draft MGM Brakes Site Well Inventory Report*. October 1
- Canonie Environmental, Inc. 1992. *Technical Memorandum Number 1: Results of Additional Studies for Soil and Concrete, MGM Brakes Site, Cloverdale, California*. February.
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